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MARCH 1941

UNITED STATES
DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, SECRETARY

BUREAU OF MINES
R. R. SAYERS, DIRECTOR

INFORMATION CIRCULAR

MARKETING OF BARITE

BY

BERTRAND L. JOHNSON

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March 1941.

INFORMATION CIRCULAR

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

MARKETING OF BARITE[1]

By Bertrand L. Johnson[2]

PROPERTIES

Barite, the natural sulfate of barium ($BaSO_4$), is the most important barium mineral. Normally it is white (opaque to translucent), but impurities sometimes render it yellow, gray, blue, brown, red, or black. Brown or red stains are commonly caused by iron oxide. Barite is unusually heavy (specific gravity, about 4.5); in fact, it is one of the heaviest of the nonmetallic minerals. It is brittle and fractures unevenly. The hardness of barite ranges from 2.5 to 3 but is usually about 3. It can be scratched by a copper coin. Pure barite contains 65.7 percent BaO and 34.3 percent SO_3. Much of the crude barite ore mined, however, contains impurities; thus it has a lower content of barite and consequently less barium oxide. Commercial analyses show its total $BaSO_4$ content.

Barium also occurs in nature as the mineral witherite ($BaCO_3$), which, however, is not common in the United States, and commercial deposits have been found only in California. Witherite is a yellowish-white, light-gray, or white mineral with a specific gravity of about 4.3, a hardness of 3 to 4, and an uneven to subconchoidal fracture.

OCCURRENCE

Barite depostis are distributed widely throughout the world. Many foreign countries have important deposits, especially Germany, the U.S.S.R., Australia, France, Great Britain, India, Italy, and Spain. In the United States barite deposits occur in many of the Southern, Central, and Western States. Those of Virginia, North Carolina, South Carolina, Georgia, Alabama, Tennessee, Kentucky, and Missouri are deeply weathered vein and replacement deposits, and current production comes almost entirely from the upper portions of the deposits, where they have been enriched by weathering. On the other hand, the western deposits are little weathered.

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Information Circular 7149."

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USES

The commercial uses of barite are traceable largely to its barium content (as in the barium chemical and glass industries), its whiteness (as in the paint, lithopone, and paper industries), its heavy weight (as in oil-well drilling and paper industries), its chemical inertness, or its comparatively low price.

Crushed and ground barites are used as such in the glass, paint, paper, oil-well drilling, and various filler industries, or are themselves the raw materials for the production of lithopone or various barium chemicals, such as blanc fixe and barium nitrate. In recent years greater quantities of crude barite have entered into the manufacture of crushed and ground barite than into any other use, owing principally to the greatly increased use of ground barite as the heavy medium in mud for drilling deep oil wells where high gas pressures are encountered, which is the leading use for ground barite. Another growing use of crushed and ground barite is in the manufacture of certain types of glass, such as optical glass and various kinds of glassware. Barite ground to various degrees of fineness is used as an inert filler in such industries as rubber, oilcloth, paper, plastics, and resins. Limited quantities of ground barite are used as extenders and loaders in paints.

Formerly the greatest single use of barite was in the manufacture of lithopone, but in 1938 and 1939 less barite was used for this purpose than in the production of crushed and ground barite. Lithopone—an intimate mixture of zinc sulfide and barium sulfate, usually in the ratio of about 30 to 70 percent, respectively, is made by the coprecipitation of solutions of zinc sulfate and barium sulfide. The barium sulfide is obtained by the furnace reduction of barite with coal or coke, the product, which is known as black ash and contains about 70 percent BaS, being leached in hot water to obtain the barium sulfide solution. Lithopone is used most extensively as a white pigment in paint, but also finds use in linoleum, textiles, rubber, and other products.

Barite is the raw material for the manufacture of most barium chemicals, the first step being reduction to soluble barium sulfide or barium chloride. The principal barium chemical made is blanc fixe (precipitated barium sulfate). This is used chiefly as a pure white pigment of filler in paints, rubber goods, linoleum, oilcloth, and some grades of paper. Precipitated barium carbonate is used in the ceramic industry to prevent the development of scum on wares and for the manufacture of optical glass. It is also used in paints and for making barium peroxide. Barium chloride is used in the manufacture of lake colors, as a chemical reagent, and in the ceramic industry. Barium nitrate is used in making barium dioxide, in fireworks, and green signal lights. Both barium chloride and barium nitrates are said to have medicinal uses.

Witherite is used in the glass and heavy clay-products industries as

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the raw material for the manufacture of various barium chemicals and for the case-hardening of steels.

PRODUCTION

World output of barite has now reached about a million tons a year. It is produced in many countries. Germany and the United States are by far the greatest producers, together supplying about three-fourths of the total annual supply. The United Kingdom, Italy, Greece, and France are other but less important sources. Late in 1940, it was reported that an extraordinarily large deposit of barite had been discovered near Windsor, Nova Scotia.

In the United States barite is produced chiefly in three distinct regions, (1) the midwestern, represented by Missouri and Arkansas, (2) the southern, consisting of Virginia, South Carolina, Tennessee, Kentucky, Georgia, and Alabama; and (3) the western, composed of California, Arizona, and Nevada. Small quantities have also come from scattered districts in other Western States and from Alaska and Wisconsin.

Witherite is produced domestically only in California. By far the greater part of the world supply comes from Northumberland County, England.

DOMESTIC SALES

The total quantity of domestic crude barite sold or used by producers has risen irregularly from less than 100,000 tons a year before the World War of 1914-18 to 383,609 short tons, with a value of $2,344,103, in 1939. Missouri is the leading State both as to quantity and value of sales, while Georgia is second. Crude barite has also been sold in one or more of the past 5 years from the following States: Alabama, Arkansas, Arizona, California, Colorado, Montana, Nevada, South Carolina, Tennessee, Texas, and Virginia. Sales in recent years, by States, insofar as they can be shown without disclosing confidential information are given in the following table:

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Crude barite sold or used by producers in the United States, 1935-1939, by States

Year	Missouri		Georgia		Others		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1935...	131,921	$727,888	30,577	$178,254	62,613	$345,126	225,111	$1,251,268
1936...	160,866	1,008,528	38,435	206,336	83,859	459,767	283,160	1,674,631
1937...	198,101	1,430,397	71,944	400,687	85,843	409,886	355,888	2,240,970
1938...	156,539	1,150,630	64,304	315,329	88,820	538,562	309,663	2,004,521
1939...	171,642	1,163,870	86,589	438,378	125,378	741,855	383,609	2,344,103

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FOREIGN TRADE

Imports.- A considerable tonnage of crude barite is imported annualy into Atlantic coast ports. The general trend in the quantity imported since 1929 has been downward accompanied by a rise in average value that in 1938 reached $6.09 per short ton. For many years imports consisted largely of German barite that came either direct from Germany or was transshipped from the Netherlands. As recently as 1938, 74 percent of these imports into the United States originated in Germany; the rest came from Cuba in that year. In 1939, however, no imports of barite were received from either Germany or the Netherlands. On the other hand, imports of barite from Cuba nearly doubled those of 1938 and, except for 51 tons from Algeria and 1 ton from Canada, constituted the entire supply from foreign sources. The total quantity of barite imported in 1939 was slightly less than half as great as in 1938, and the average value dropped from the $6.09 per ton figure of 1938, when German barite was the dominant material imported, to $4.83 per ton in 1939, when virtually all of it came from Cuba. The total quantity of barite imported in 1939 was the smallest since 1921. A few thousand tons of witherite has been imported annually from England.

Barite and witherite imported for consumption in the United States, 1935-39

(Value at port of shipment)

Year	Barite (crude)		Witherite (crude, unground)	
	Short tons	Value	Short tons	Value
1935.....	47,047	$246,254	2,634	$48,551
1936.....	33,843	170,316	2,464	44,475
1937.....	64,992	327,224	4,556	82,341
1938.....	24,845	151,235	2,115	43,568
1939.....	11,538	55,985	3,819	64,106

Exports.- A fairly substantial export demand for domestic ground barite for oil-well drilling has developed recently in Trinidad and other countries, and minor quantities of other barium products are reported as exported. Exports of barite, however, are not recorded separately.

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MARKETS

The United States appears to be the world's largest barite market (now taking at least 400,000 tons a year), consuming not only its own large production but also the considerable quantities imported. The markets for crude barite in the United States are (1) in the Atlantic Coast States, (2) along the Pacific coast, and (3) in the central and northern parts of the Mississippi Valley. Markets for barite exist in the crushed- and ground-barite, lithopone, and barium chemical industries of all these regions.

About 60,000 tons of crude barite is consumed annually on the Pacific coast, and the balance of the domestic yearly consumption is taken by the various markets in the Central and Eastern States. California processes and consumes the larger part of the western production of barite (and witherite). The Colorado market (sugar industry) is supplied partly from Colorado and partly by imported witherite. The Kansas lithopone industry draws upon Colorado and Missouri; Missouri consumes most of its own product, sending some to the North Central States, which also draw on the southern barite-producing region. The Atlantic-coast market is supplied by the southern barite region and by imported barite.

The quantities of crude barite used in various barite-consuming industries in the last 10 years are shown in the following table:

Crude barite (domestic and imported) used in the manufacture of barium products in the United States, 1935-39, short tons

Year	In manufacture of-			
	Crushed and ground barite	Lithopone	Barium chemicals	Total
1930...	69,426	178,944	76,825	325,195
1931...	35,393	157,181	72,696	265,270
1932...	36,402	120,378	32,629	189,409
1933...	38,026	131,761	53,260	223,047
1934...	61,123	140,734	48,619	250,476
1935...	93,692	146,164	50,488	290,344
1936...	83,990	167,014	52,445	303,449
1937...	148,930	162,681	72,371	383,982
1938...	193,728	117,007	54,250	364,985
1939...	192,112	141,556	58,015	391,683

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It will be noted that the relative importance of the various outlets for crude barite have been changing in recent years. Lithopone, which formerly consumed more barite than all the other industries put together, has recently yielded first place to ground barite, which in 1938 consumed over half of the barite used in the United States. The manufacture of barium chemicals alternated with the production of ground barite for second place for a few years before 1934, when the use of ground barite for oil-well drilling began to develop on a large scale. During the last decade the output of lithopone has diminished, whereas the total requirements of the barium chemical manufacturing industry has fluctuated irregularly.

Only a portion of the crude barite requirements of domestic consumers is purchased in the open competitive markets, as several of the largest consumers or processors of barite have their own mines. Actual sales are mostly on a contract basis. No standard tests or specifications for crude barite have been widely accepted. Minimum barium sulfate content and maximum iron content, however, are specified in all transactions, and in some instances the grain size is also specified. Crude barite of commercial grade usually analyzes at least 93 percent barium sulfate, and the better grades carry at least 95 percent. Barium chemical plants are said not to accept ore of less than 90 percent $BaSO_4$ and also specify the maximum content of iron and other impurities. Crude barite for grinding for use in oil-well drilling is reported to be acceptable down to 89 percent $BaSO_4$, provided the specific gravity is about 4.2 or better. Specifications for the glass trade are more exacting than those of other barite-consuming industries.

PRICES

Crude barite is a relatively low priced commodity; the average annual value of domestic sales in the past 40 years has ranged between $2 and $10 per short ton. The World War of 1914-18 had a drastic effect on the average value of domestic as well as imported crude barite. In 1916, owing to the scarcity of German barite, the average declared value of imported barite jumped suddenly to $14.41 per ton, and in 1917 it was $10.50; after the importation of German barite was resumed in 1919, the average declared value fluctuated between $3 and $6 up to the cessation of imports in 1938. The demand for domestic barite after barite imports were cut off in 1918 boosted the average value of the sales of domestic crude from $6.73 in 1918 to a peak of $9.39 a ton in 1920. The irregular decline since in the average value of the domestic sales has not yet brought that value down to pre-war levels (about $3 a ton). In 1933 a post-war low average of $5.08 was reached; in 1939 the average value had reached $6.11 per short ton.

Market quotations, according to the Engineering and Mining Journal Metal and Mineral Markets, for crude barite from Georgia, f.o.b. mines, have remained unchanged at $7 per long ton from 1935 to 1940, inclusive. The price of Missouri crude barite (minimum 95 percent $BaSO_4$, less than 1 percent iron) was quoted at $6.25 to $7 per ton during 1940; and the 93 percent $BaSO_4$ grade was quoted at $6 to $6.50 per ton for the same period.

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Current price quotations on barite and (or) barium compounds are carried by the following trade journals:

Oil, Paint & Drug Reporter.
Engineering and Mining Journal Metal and Mineral Markets.
Chemical Industries.
Chemical and Metallurgical Engineering.
Canadian Chemistry and Process Industries.
The Glass Industry.

BARITE PRODUCERS.

California:

Bradley Mining Co., 425 Crocker Bldg., San Francisco.
Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles.

Georgia (Cartersville):

Cartersville Barium Corporation.
New Riverside Ochre Co.
Paga Mining Co.
Barytes Mining Co., P. O. Box 224.
T. E. Johnsey.

Missouri:

D. N. Baker, Mineral Point.
W. E. Bernhardt, Route 3, De Soto.
Clarence Bess, Bonne Terre.
R. A. Blount, Potosi.
L. A. & Carl Campbell, Russellville.
M. & Q. Mining Co., Blackwater.
Evans & Russell, Potosi.
Gratz & Thompson, De Soto.
H. B. Hart & G. C. West, Versailles.
A. H. Long, Cadet.
McDonald Mining & Engineering Co., 6217 Wabash Ave., Kansas City.
Osage-Ozark Mining Co., Versailles.
Ozark Products Co., P. O. Box 190, Potosi.
Point Milling & Manufacturing Co., Mineral Point.
O. S. Reavis, Barnett.
J. W. Settle, Potosi.
J. W. Steenburgen, Henley.
Superior Mineral Co., Cadet.
J. Marshall Thompson, De Soto.
Valle Mining Co., 415 Pine St., St. Louis.
Washington Land & Mining Co., 315 Washington Ave., St. Louis.
Boyer & Towl, Cannon Mines.
H. E. Brown, Blackwell.

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B. O. Casey, et al, Potosi.
P. A. Clancy, Blackwell.
H. R. Brill, R.R. 3, De Soto.
Brentwood Cole, Blackwell.
H. Kelly, Valles Mines.
Walter McFarland, De Soto.
C. E. Boyer, Blackwell.
J. P. Muir, Versailles.
L. E. Cole, Blackwell.
S. McKinstry, Blackwell.
J. R. Politte, Blackwell.
Mrs. Nellie Cook, De Soto.
D. B. Groves, Potosi.
Dr. H. L. Luckey, 2816 Sutton Ave., Maplewood.
Bob McGregor, Hugh McGregor Estate, Potosi.
Ed Martin, Route 1, Cadet.
Parole M & M Co., 5185 Lindell Blvd., St. Louis.
G. F. Pinson, Route 1, Cadet.
Anthony Recar, Cruise.
Mrs. E. Wallace, Mineral Point.
Wallace & Carr, Potosi.
Estate of Bee Walton, Potosi.
Estate of H. Walton, Mineral Point.
Leo I. White, Mineral Point.
White & Brother, Potosi.
Thomas White, Mineral Point.
J. H. Wigger, Mineral Point.

Nevada:

Barium Products, Ltd., Modesto, Calif.
California-Nevada Barytes Mines, Division of the Glidden Co., 766 50th Ave., Oakland, Calif.

South Carolina:

Clinchfield Sand & Feldspar Co., 430 Hearst Tower Bldg., Baltimore, Md.

Tennessee:

Wolf River Corporation, Jamestown.
L. A. Wood Co., Sweetwater.
Tennessee Barytes Co., Chattanooga.
Sweetwater Mining Co., Sweetwater.

Virginia:

Barium Mining Corporation, Drawer 1, S. Charleston, W. Va.

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BUYERS OF BARITE, ACCORDING TO LATEST REPORTS TO BUREAU OF MINES

California:

American Rubber Mfg. Co., Park Ave. & Watts St., Oakland (ground).
Industrial Minerals & Chemical Co., Berkeley.
Synthetic Iron Color Co., Richmond.
Chamberlain Co., 2550 East 9th St., Los Angeles (crude).
Samson Tire & Rubber Co., 5725 Telegraph Road, Los Angeles (crude and ground)
Commercial Minerals Co., San Francisco (crude and ground).
Pioneer Rubber Mills, 353 Sacramento St., San Francisco (ground).

Canada:

K. V. Gardner, K. V. Gardner, Ltd., 831 Seigneurs St., Montreal.

Connecticut:

Seamless Rubber Co., New Haven (ground).
Jenkins Bros., Rubber Division, 514 Main St., Bridgeport (crude and ground).

Delaware (Wilmington):

E. I. du Pont de Nemours & Co., Inc., 11th & Orange St. (barite minerals).
Electric Hose & Rubber Co., 1201 Dure St. (ground).

England:

Blackwell's Metallurgical Works, Ltd., Speke Road Works, Garston, Liverpool.

Georgia (Cartersville):

Frank Smith.
Thompson, Weinman & Co.

Illinois:

Chicago Copper & Chemical Co., Blue Island (barite chemicals).
F. E. Schundler & Co., 606 Railroad St., Joliet (crude).
Geo. S. Mepham Corporation, East St. Louis.
Point Milling & Mfg. Co., 20th & Lynch Ave., East St. Louis.
Brunswick-Balke Collender Co., 623 So. Wabash Ave., Chicago (crude and ground).
A. Daigger & Co., 161 West Kinzie St., Chicago (barium).

Indiana:

National Tile Co., Inc., Anderson (barium carbonate).
Paranite Wire & Cable Corporation, Jonesboro (crude and ground).

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Kansas:

Ozark Smelting & Mining Co., Coffeyville.

Maryland (Baltimore):

Clinchfield Sand & Feldspar Co. (crude).
Seaboard Feldspar Co., Hearst Tower Bldg.

Massachusetts:

Acushnet Process Co., Wood & Young Sts., New Bedford (crude and groung).
Archer Rubber Co., Milford (crude and ground).
Boston Woven Hose & Rubber Co., Condor & Blanchard, Cambridge (crude and ground).
Clifton Mfg. Co., Inc., 65 Brookside Ave., Boston (crude and ground).
Davidson Rubber Co., Charlestown, Boston (ground).
Fisk Rubber Co., Chicopee Falls (crude and ground).
Hood Rubber Co., Inc., Watertown (ground).
Raytheon Production Corporation, 55 Chapel St., Newton.
Stedman Rubber Flooring Co., Hancock St., South Braintree (crude).
Tyer Rubber Co., 100 Railroad Ave., Andover (crude and ground).

Michigan:

Industrial Rubber Goods Co., St. Joseph (ground).

Missouri (St. Louis):

Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles, Calif.
Cupples Co., 7th & West Corner Spruce St.
Mallinckrodt Chemical Works (minerals).
Titanium Pigment Co., Inc. (crude and ground).

New Jersey:

J. T. Baker Chemical Co., Phillipsburg (chemicals).
Manhattan Rubber Mfg. Co., Townsend St., Passaic (crude and ground).
Merck & Co., Inc., 1935 Kerrigan Road, Rahway (barium minerals).
Krebs Pigment & Color Corporation, Newark (crude and ground).
United Color & Pigment Co., Newark.
Acme Rubber Mfg. Co., Trenton (crude and ground).
Home Rubber Co., 100 Wolverton Ave., Trenton (crude and ground).
Murray Rubber Co., Trenton (crude and ground).
Whitehead Bros. Rubber Co., Trenton (crude and ground).

New York:

General Electric Co., 1 River Road, Schenectady (barium).

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Hewitt Rubber Corporation, 245 Kensington Ave., Buffalo (white and natural
Smith Chemical & Color Co., Inc., 55 John St., Brooklyn (barium sulfate).

New York City:

American Cyanamid & Chemical Corporation, 30 Rockefeller Plaza (barium minerals).
American Fluoride Corporation, 151 West 19th St. (salts).
H. J. Baker & Brother, 271 Madison Ave. (barium minerals).
Barium Products, Ltd., 405 Lexington Ave. (barium minerals).
Barth Metals, Inc., 15 Park Row (barium).
H. C. Bugbird Co., 120 Liberty St. (also witherite) (crude and ground barite).
Eagle Pencil Co., 703 East 13th St. (crude and ground).
Franks Chemical Products Co., Inc., Bush Terminal (barium chloride).
General Chemical Co., 40 Rector St. (crude).
Good Mfg. Co., 305 East 134th St. (crude and ground).
Hammill Gillespie, Inc., 125 Broadway (barium minerals).
Chas. Hardy, 415 Lexington Ave.
Hodgeman Rubber Co., 200 Fifth Ave. (ground).
Hummel Chemical Co., Inc., 90 West St. (barites and barium minerals).
Adolphe Hurst & Co., 328 West 42nd St. (barium minerals).
Innis, Speiden & Co., 121 Liberty St. (barium minerals).
International Selling Corporation, 70 Pine St. (barium minerals).
Jungman & Co., Inc., 157 Chanbers St. (barium minerals).
Kelly-Springfield Tire Co., 405 Lexington Ave. (crude and ground).
Minerals & Insulation Corporation, 70 Pine St. (barium minerals).
Wm. H. Muller & Co., Inc., 122 East 42nd St.
New Jersey Zinc Co. of Pennsylvania, 160 Front St. (crude).
Oakland Chemical Co., 59 4th Ave. (barium minerals).
C. J. Osborne Co., 132 Nassau St.
R. & H. Chemical Division, 350 Fifth Ave.
L. A. Solomon & Bros., 216 Pearl St.
Joseph Turner & Co., 500 Fifth Ave. (barium minerals).
George Uhe Co., Inc., 102 Maiden Lane.
United States Rubber Products Co., 1792 Broadway (ground).
Vulcanized Rubber Co., 263 Fifth Ave. (crude and ground).
Warner Chemical Co., 403 Lexington Ave. (barium minerals).
Whittaker, Clark & Daniels, Inc., 245 Front St. (barium).
Wishnick-Tumpeer Inc., 295 Madison Ave. at 41st St. (barium minerals).

Ohio:

Johnson Rubber Co., 111 Vine St. Middlefield (crude and ground).

Akron:

Firestone Tire & Rubber Co., 1400 So. Main St. (crude and ground).
B. F. Goodrich Co., 450 So. Main St. (crude and ground).
Goodyear Tire & Rubber Co. (ground).
Miller Rubber Co., Inc., (ground).

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Cincinnati:

Eagle-Picher Lead Co., Temple Bar Bldg. (crude).
Globe Chemical Co., Murray Road and Big Four Railroad (crude and ground).
National Sales Corporation, 31-35 East 13th St.
Richardson Co., Lockland (crude and ground).

Cleveland:

The Glidden Co., 11,100 Glidden Ave. (crude).
Harshaw Chemical Co., 1933 East 97th St. (barium minerals).
McGean Chemical Co., Keith-McGean Bldg. (barium minerals).
F. E. Davis, Sherwin-Williams Co., Midland Bldg. (crude).

Pennsylvania:

Ceramic Color & Chemical Co., New Brighton (crude and ground).
Chemical & Pigment Co., Inc., Scranton (crude and ground).
Keasbey & Mattison Co., Butler Ave. & Maple St., Ambler (ground).

Philadelphia:

Foote Mineral Co., Inc., 1610 Summer St. (barium minerals, crude barite).
Quaker City Rubber Co., 1935 Wharton Ave. (ground).

Pittsburgh:

C. Hommel Co., 211 4th Ave. (crude and calcined).
Vitro Mfg. Co., Corliss Station (barium minerals).
Westinghouse Electric & Mfg. Co., 35 Cable Ave. (East) (barium).

Rhode Island:

Davol Rubber Co., Providence.

Texas:

Humble Oil & Refining Co., Post Office Drawer 2180, Houston (ground).

West Virginia:

Barium Reduction Corporation, Charleston (crude).

Wisconsin:

Chicago Rubber Clothing Co., Racine (water-ground barite).

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BARITE GRINDERS

California:

Barium Products Ltd., Newark.
Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles.
Chemical & Pigment Co., Inc., 766 50th Ave., Oakland.
Commercial Minerals Co. of San Francisco, San Francisco.
Industrial Minerals & Chemical Co., 6th & Gilman St., Berkeley.

Georgia:

Thompson, Weinman & Co., Cartersville.

Illinois:

Geo. S. Mepham Corporation, 2001 Lynch Ave., East St. Louis.
F. E. Schundler & Co., Inc., 600 Railroad St. Joliet.

Missouri:

Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles.
De Lore Division, National Lead Co., P. O. Box 2808, Carondelet Station, St. Louis.
Superior Mineral Co., Cadet.

New York:

F. E. Schundler & Co., Inc., 45-15 Vernon Blvd., Long Island City.

South Carolina:

Clinchfield Sand & Feldspar Co., 430 Hearst Tower Bldg., Baltimore, Md.

PRODUCERS OF BARIUM PRODUCTS

California:

Barium Products Ltd., Modesto.
Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles.
Chemical & Pigment Co., Inc., 766 50th Ave., Oakland.
Commercial Minerals Co. of San Francisco, San Francisco.
Industrial Minerals & Chemical Co., 6th & Gilman St., Berkeley.
Pacific Minerals Co., Ltd., 337 10th St., Richmond.

Delaware:

E. I. du Pont de Nemours & Co., 10032 du Pont Bldg., Wilmington.

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Georgia:

Chemical Products, Cartersville.
Thompson, Weinman & Co., Cartersville.

Illinois:

Chemical & Pigment Co., Inc., P. O. Box 191, Collinsville.
Chicago Copper & Chemical Co., Blue Island.
Eagle-Picher Lead Co., Temple Bar Bldg., Cincinnati.
New Jersey Zinc Co., Mineral Point Zinc Division, 160 Front St., New York City.
F. E. Schundler & Co., Inc., 600 Railroad St., Joliet.
Sherwin Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio.

Kansas:

Ozark Smelting & Mining Co., 101 Prospect Ave., N. W., Cleveland, Ohio.

Maryland:

Chemical & Pigment Co., Inc., St. Helena, Baltimore.

Missouri:

Baroid Sales Division, National Lead Co., 830 Ducommun St., Los Angeles.
Geo. S. Mepham Corporation, 2001 Lynch Ave., East St. Louis.
Superior Mineral Co., Cadet.
National Lead Co. Titanium Division, 111 Broadway, New York City.

New Jersey:

E. I. du Pont de Nemours & Co., 10032 du Pont Bldg., Wilmington, Del.
United Color & Pigment Co., Inc., Newark.

New York:

Oakland Chemical Co., 59 Fourth Ave., New York City.
F. E. Schundler & Co., Inc., 45-15 Vernon Ave., Long Island City.

Pennsylvania:

New Jersey Zinc Co. of Pennsylvania, 160 Front St., New York City.

Rhode Island:

Hercules Powder Co., Providence Drysalters Division, Wilmington, Del.

South Carolina:

Clinchfield Sand & Feldspar Co., 430 Hearst Tower Bldg., Baltimore, Md.

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I. C. 7149

West Virginia:

Barium Reduction Corporation, Drawer 1, South Charleston.
Standard Ultramarine Co., Huntington.

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